

STX-100



STX-100 - SILICON NITRIDE, DENSE

ABOUT STX-100

SINTX's STX-100 is a very dense form of silicon nitride (Si_3N_4) that is processed from a very high-quality silicon nitride powder and is densified by high temperature sintering followed by a final densification process called hot isostatic pressing. The combination of high-quality raw materials with a carefully controlled, two-step densification process yields a high-strength ceramic material with excellent mechanical and thermal properties.

Typical Applications:

- Igniters
- Bearing Rollers/Balls
- Valves and Sealing Parts
- Welding Pins
- Nozzles
- Substrates
- Insulation Plates/Rings
- Induction Heating Coil Support

ABOUT SINTX

SINTX Technologies is an original equipment manufacturer (OEM) that develops and commercializes advanced ceramics for biomedical, aerospace, industrial, and armor applications. SINTX collaborates with customer and partner organizations to innovate within these sectors.

CONTACT

MADE IN THE USA



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Patent Info: www.sintx.com/resources/patents

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Property	Typical	Units	Test Method
Density	3.26	g/cm^3	ASTM C373
Water Absorption	0	%	ASTM C373
Color	Gray	-	-
Grain Size	0.5 x 5.0	μm	BS EN 623
Flexural Strength, 3-pt Bending	975	MPa	ASTM C1161
Flexural Strength, 3-pt Bending at 1000°C	750	MPa	ASTM C1161
Weibull Modulus	15	-	ASTM C1239
Elastic Modulus	329	GPa	ASTM C1161
Shear Modulus	135	GPa	DIN EN 843-2
Bulk (Young's) Modulus	194	GPa	DIN EN 843-2
Poisson's Ratio	0.22	-	DIN EN 843-2
Hardness	15	GPa	ASTM C1327
Fracture Toughness	5.4	$\text{MPa}\cdot\text{m}^{1/2}$	ASTM E399
Phase Composition	100% β - Si_3N_4	%	X-ray Diffraction JCPDS-ICDD 00-082-0697
Thermal Conductivity at 25°C	24.0	$\text{W/m}\cdot\text{K}$	ASTM E1461
Thermal Conductivity at 400°C	17.0	$\text{W/m}\cdot\text{K}$	ASTM E1461
Thermal Conductivity at 800°C	12.5	$\text{W/m}\cdot\text{K}$	ASTM E1461
Thermal Conductivity at 1200°C	10.1	$\text{W/m}\cdot\text{K}$	ASTM E1461
Coefficient of Thermal Expansion at 200°C	2.0	$10^{-6}/\text{K}$	ASTM E228
Coefficient of Thermal Expansion at 400°C	2.5		ASTM E228
Coefficient of Thermal Expansion at 800°C	3.0		ASTM E228
Coefficient of Thermal Expansion at 1200°C	3.6		ASTM E228
Specific Heat	0.65	$\text{J/kg}\cdot\text{K}$	ASTM E228
Volume Resistivity at 20°C	$>10^{14}$	$\Omega\cdot\text{cm}$	ASTM D257
Volume Resistivity at 300°C	$>10^{11}$	$\Omega\cdot\text{cm}$	ASTM D257
Volume Resistivity at 500°C	$>10^{10}$	$\Omega\cdot\text{cm}$	ASTM D257
Dielectric Constant at 1MHz	12.22	-	ASTM D257
Dielectric Loss at 1MHz	4.80E-04	δ	ASTM D2520
RF Transmission at 1 to 3 GHz	72-75	%	ASTM D2520
Dielectric Breakdown Strength	400	V/mil	ASTM D149
	15.75	MV/m	

Typical STX-100 Microstructure

